

mathematically are not omitted, but are incorporated formally in the system by simpler quantitative devices such as specification of logical relationships, simple directional relationships, or ordinal and cardinal measurement scales. Such an approach to model construction implies the testing and validation of the operational usefulness of the model by iterative experimentation and by simulation (either on a computer or in some form of gaming). This approach to quantification we may describe as aspiring to structural and behavioural rigour rather than mathematical rigour.

In short, the essence of the proposed interdisciplinary methodology lies in an attempted marriage of the decision and behavioural sciences, and in the development of a new set of paradigms about policy problems on the basis of comprehensive systemic model building, albeit approximations of reality (many-to-one homomorphic mappings) which nevertheless have sufficient variety, i.e. sufficient structural and behavioural complexity, to serve as adequate surrogates for the greater complexity of reality, and offer conclusions which further the design, choice and implementation of policies which will achieve their specified objectives.

It would be appropriate, I believe, to stress at this point that the proposed programme is not in any sense a purely applied exercise, derivative from the existing body of theory. On the contrary, the search for a new set of paradigms and a new methodological synthesis defines a major aspect of the programme as theory evaluation and construction. The theoretical base and its application are indeed viewed as entirely complementary in the programme, the theoretical base nourishing the application of theory and concepts, providing testable hypotheses, and being continually modified and improved in the light of its success in application, the application of concepts and theory being correspondingly improved in the light of theoretical and conceptual developments. It is this very emphasis on the theoretical and conceptual apparatus which distinguishes the programme from its entirely complementary counterparts as technical colleges and colleges of advanced education in Australia.

LOGIC AND LAW: SOME INTERDISCIPLINARY PROBLEMS

MAREK Z. TUFMAN*

"... logic, and history, and customs, and utility, and the accepted standards of the right conduct, are the forces

which singly or in combination shape the progress of the law."

CARDOZO, B. N.¹

LOGIC. A word which is in everyday use in the judicial exercise. Do we understand it? Are we able to find its exact place in law and legal reasoning?

The question of the significance of logic in law and its place in legal reasoning cannot be answered without difficulties. It is much easier to say where to look for an answer: in method. And a method of law or of its exercise is the way in which legal statements are motivated.

But how should a legal statement be created? As any other statement? As, perhaps, a mathematical theorem? As a scientific statement? But can the legal system use the method applied by science? Or is it, perhaps, a science itself?

Consideration of these questions is the topic of this essay. If we do find here a final answer we may at least succeed in partially clearing the way to it.

The opinion that "neither law nor human nature is an exact science"² is widely accepted. Even if "there is no way by which modern law can escape from the scientific and artificial character imposed on it by the demand of modern societies in full, equal, and exact justice".³ Pound asks the questions directly: "But what do we mean by the word 'scientific' in this [legal] connection? What is scientific law? What constitutes science in the administration of justice?"⁴ He notices the clue given here by Pollock who finds three reasons for which law has to take a scientific character: the demand for (i) full justice, (ii) equal justice, and (iii) exact justice. The attributes of law are, thus, conformity to reason, uniformity, and certainty and this, certainly, shows that "this scientific character of law is a means—a means toward the end of law, which is administration of justice".⁵

We said "certainly", although it is certain only under two conditions: (i) that law in its essence is separated from its scientific character and (ii) that this scientific character is a means toward the end of law.⁶ We shall assume that the first condition is false: it is not possible to separate anything from its character. If so, if law is the same thing as its scientific character, then the second condition has to turn out to be false for law cannot be a means of its own end.

Pound is right when he says that "law is not scientific for the sake of science"⁷ and he is right that it is a means towards an end.

* Lecturer in Law, University of Papua New Guinea.

Whatever this end could be, "law must be judged by the results it achieves, not by the niceties of its internal structure; it must be valued by the extent to which it meets its end, not by the beauty of its logical processes or the strictness with which its rules proceed from the dogmas it takes for its foundation".⁸ Now, consequently, if we were able to prove that legal reasoning using the "beauty" of the logical processes drives us to better results in goal achievements than legal reasoning using other processes, we would justify the presence of logic and scientism in this area.

It seems that most of the writers are afraid of the vision of logic in legal reasoning. "We think that the strongest logic is that of experience"⁹ they say and assume that experience and logic may be unequal. They say that "juries are not bound by what seems inescapable logic to judges"¹⁰ and escape to smart intuition and "healthy moral judgment". And they find the dangers which "have to be guarded against in a scientific legal system".¹¹

Pound finds two dangers, in the first of which he is afraid of "the effect of its scientific and artificial character upon the public"¹² and in the second he is equally afraid of the kind of effect it can place upon the courts and legal profession.

"With respect to the first danger," says Pound, "it is well to remember that law must become too scientific for the people to appreciate its workings."¹³ Well, even in 1908, when these remarks were written, the legal provisions became so detailed, technical and complicated that no one could be expected to appreciate their workings. Finally, it is not a new sign: if the Romans created a rule *ignorantia iuris nocet* they did so because even their laws (how simple in comparison with ours!) were so undoubtedly unreadable by an average man that they needed an additional protection.

Pound's apprehensions as to the fate of a public faced with mechanical jurisprudence are not very consequent since, as he says, "undoubtedly one cause of the tendency of scientific law to become mechanical is to be found in the average man's admiration for the ingenious in any direction, his love of technicality as a manifestation of cleverness, his feelings that law, as a developed institution, ought to have a certain ballast of mysterious technicality".¹⁴

Certainly, a man is expecting to find in law something more than only clever rules arranged in mysterious ways. If he gives his support to the legal system it is because he is in need of protection in defined areas. Not all of the legal areas are equally appreciated by the public: its interest in the provisions concerning, e.g., the technical structure of 10-cent coins is much lower than in those

concerning inheritance. We could say that of immediate public interest are only norms directly connected with the basic principles, and it is not by accident that these norms are formulated in the most simple and understandable language. The other areas, covering more technical subjects and including more technical provisions, may be of every-day interest for only a selected group of specialists and if they become a subject of public attention, they require interpretation and even "translation" into terms of common parlance.

Also as Holmes says: "No one can think it desirable that criminals should escape through technicalities which are useless as safeguards to liberty, and only serve to make conviction more a matter of chance."¹⁵

This Holmes' opinion takes on more colours if we put it into light of his general conception of law. Frank is quite right when he says that Holmes could be said to represent "non-Euclidean" legal thinking,¹⁶ but it is rather a poor compliment to this outstanding legal practitioner and theorist. "Because he was the first thinker," says Frank, "completely to undermine the conception that law resembles pure geometry, because he wrote that a legal system 'cannot be dealt with as if it contained only the axioms and corollaries of a book of mathematics', and that it was dangerous to believe 'that a given (legal) system, ours, for instance, can be worked out from some general axioms of conduct', Holmes can fairly be said to have invented non-Euclidean legal thinking."¹⁷

Even if Holmes had enough difficulties in defending his position in terms of universal validity, he also got an ill turn from Frank. Presenting the axiom that decisions result from the application of the "Law" to the "Facts", Frank writes: "In process of deciding a case, the judge always first determines what are the facts, then finds and applies a legal rule, and then reaches his decision. Judges seldom, if ever, begin with their conclusion and work backwards to a statement of fact and a statement of the rule. This axiom may be schematised thus: Let R be the legal rules; let F be the 'facts' of any case; let D be the decision. Then $R \times F = D$. The judge first finds the F, then applies the appropriate R. By multiplying $R \times F$ he reaches his D."¹⁸

This all would be correct were it not for one question which has to follow: what does "to apply" mean in this connection? How does the judge do his multiplication? Holmes' answer is simple: "The decision will depend on a judgment or intuition."¹⁹ Moreover, this "judgment or intuition" is "more subtle than any articulate major premise".²⁰

In giving such an opinion which, by the way, could stand on end the hair of the most habitual criminals, Holmes could be expected to give an appropriate value to human experience. Finally, on this experience (if, hopefully it can somehow influence judges' intuition) is to be based the judicial decision. "Upon this point," he says, "a page of history is worth a volume of logic."²¹ It seems to deny that historical processes and human experience are products of logically bound facts. Logic writes the facts and never *vice versa*.

It is true that "we do not realise how large a part of our law is open to reconsideration upon a slight change in the habit of the public mind".²² It is also true that "no concrete proposition is self-evident, no matter how ready we may be to accept it, not even Mr. Herbert Spencer's 'Every man has a right to do what he wills, provided he interferes not with a like right on the part of his neighbours' ".²³ But these statements can only support our position and further diminish the value of intuition as the way of deciding in a case before the court.

Professor John Dewey presented an opinion that these strictures of Justice Holmes apply in full force to "one logic" only, namely "the one which has had greatest historic currency and exercised the greatest influence on legal decision"²⁴ i.e., the logic of syllogism.²⁵

For Holmes, says Dewey, syllogism "claims to be a logic of fixed forms rather than of methods of reaching intelligent decision in concrete situations, or of methods employed in adjusting disputed issues on behalf of the public and enduring interest".²⁶ We could say that this is a rather strange interpretation of the statements of syllogism and is based on an obvious misunderstanding. Although the basic principles of syllogism as applied to legal reasoning are the same as applied in mathematical logic, the functional approach is quite different. Therefore, we can fully agree with Dewey when he mentions that "it is foolish to criticise the model supplied by the syllogism".²⁷

One could argue that Holmes is not criticising the model of syllogism but only its usefulness for decision making in legal areas. However, it is not exactly so. If we agree that there is no better proof for correct reasoning than its consistency with syllogic schemas, Justice Holmes seems to disagree with our beliefs: "The whole outline of the law is the resultant of a conflict at every point between logic and good sense."²⁸

It is only unfortunate that Holmes offered no further explanation of this statement, and one faces much difficulty in attempting to picture this peculiar conflict.

If the traditional logic found its way to jurisprudence quite difficult, the difficulties appear to be even greater for mathematical logic. The "Principia Mathematica" by Whitehead and Russell began the contemporary period in logic, which is—in short—characterised by the following attributes: (i) complete elaborations of the theory of sentence as a formalised system; (ii) development of logical semantics; (iii) development of the logical theory of probability; (iv) strict connection between logic and mathematics.

These attributes gave to mathematical logic an entry into "forbidden" areas of humanities and social sciences and gave to thinkers the key to creation of the appropriate logical systems in these areas. Both jurisprudence and legal practice are also included and every year brings new developments in this area.

Despite these tendencies, the legal writers are, in the main, still hesitant to accept the incoming propositions. However, the most recent arguments against an acceptance of logic in jurisprudence do not differ from those which we have discussed earlier in this paper. One could perhaps say that in this area the ability to create new arguments died in the early fifties of this century. It does not mean, of course, that the earlier and later writings did not deliver interesting arguments in both defence and of attack against logic in law. In this battle between "Long live Logic!" and "Down with Logic!" the opinions supporting logicians' efforts to enter law were presented by Morris R. Cohen in his paper "The Place of Logic in the Law". "Every science must use logic to test whether certain conclusions do follow from given premises,"²⁹ he says. But there are differences between the sciences. "That what distinguishes one science from another, e.g., law from physical chemistry, is the subject matter, the axioms and postulates from which conclusions are drawn. The subject matter of the law is the regulation of individuals living in those more or less permanent relations which we call society."³⁰

Cohen says that from the point of view of logic the mutual relations between men in society may be measured in strict terms, just as well as empirical facts are measured in any other science. This implies that all the theories of law which use only the metaphysical approach to their subject and attempt to ignore the empirical and, what follows, logical order fail in their efforts. "You cannot construct a building merely out of the rules of architecture."³¹ But the proper building cannot be constructed also if we ignore the rules and try to construct it basing it merely on the timber we managed to collect. It is, however, easier to achieve something taking only rules than taking only empirical material.

"Thus is explained the paradoxical fact that metaphysical philosophers of law, who try to ignore or rise high above the factual order, are frequently more productive of genuine social insight than those who are lost in the multitudinous but unimportant details of historic or ethnologic jurisprudence."³²

It would, of course, be the simplest solution if Von Ihering's dream³³ turned out to be a reality and if we got a clear view of the "disembodied spirits of good faith and bad faith, property, possession, *laches*, and rights *in rem*".³⁴ We would have "all the logical instruments needed to manipulate and transform these legal concepts and thus to create and solve the most beautiful of legal problems".³⁵ Unfortunately, it is only a dream. A lawyer still has to plod in the forest of misunderstandings and misconceptions and no wonder that he often chooses guiding him nowhere the path of "transcendental nonsense". Since all concepts are relative,³⁶ relative is also nonsense.³⁷

Any statement, legal or not, may be given different views. If, so, our logic may be shaken in its usefulness and perhaps "intuition" could take its undeserved place. Felix S. Cohen was likely the first one to open the possibility of escape from such a danger: it is the necessity of reduction to the common denominator of the different approaches. Cohen calls it "the theory of translation" for it is based on translation of a thought "from one social perspective to another".³⁸ How real is such a possibility? "Certainly we try to do this," says Cohen, "whenever we translate from one language to another. Sometimes we succeed. When we fail, it is often because we forget that a language embodies the history of a peoples' thinking and that different people have partitioned the world in different ways."³⁹ They are different ways of exercise but not of purpose; the different ways of making but not of thinking. A man usually finds it hard to believe that other men think in the same silly way as he does, but they probably do. If the way is the same, the possibility of reduction of meaning looks much better. "If a man uses a word to which he knows the other party attaches, and understands him to attach, a certain meaning, he may be held to that meaning and not be allowed to give it any other."⁴⁰

For contemporary jurisprudence a perfect translation is hard to find. Cohen even says that it may be found only in mathematics, "the set of things that enables us to translate any proposition about a straight line in Euclidean geometry into an equivalent proposition about a curve in Riemannian geometry".⁴¹ "But outside mathematics," he continues, "though we live in a world of imperfections, some imperfections are worse than others. Those of us who take

our law in realistic doses are less likely to misunderstand writers on natural law if we translate their propositions about "law" into equivalent propositions about "legal ideals."⁴²

Cohen calls for the cultivation of the "spirit of tolerance" which may ensure *pax vobiscum* at least "until mathematicians become lawyers or lawyers become mathematicians". But in great politics beside the word "tolerance" usually emerges another one: "co-operation". Let us then call for co-operation between logicians and lawyers. How much can logicians get out of this co-operation? Not too much, indeed. In fact, however, it is difficult to find a mutually equal co-operation anywhere else and this one, even if unequal, would be of definite profit to the interested parties.

"Jurists," says Morris R. Cohen, "like other men, are in their attitude to the employment of logic either intellectualists or mystics. The intellectualist not only trusts implicitly all the results of reasoning, but believes that no safe result can be obtained in any other way. Hence in law he emphasises the rule rather than the decision. This, however, leads to an ignoring of the absurd consequences to which the logical application of rules frequently leads. *Summa jus summa injuria*. The mystics distrust reasoning. They have faith in intuition, sense, or feeling."⁴³ Each is worse than the other. As usual, we face exaggeration. M. R. Cohen is right when he says that logic, as any other useful instrument, is also a dangerous one. It is also a precise instrument and requires a qualified operator.

Dewey tells us the old story of the layman who was given his post in India and as a part of his duties was to decide various controversial matters among the nations. "Upon consulting a legal friend he was told to use his common sense and announce his decisions firmly. In the majority of cases his natural decision as to what was fair and reasonable would suffice. But, his friend added, 'Never try to give reasons, for they will usually be wrong'.⁴⁴

Should they?

Acknowledgement. I would like to thank Mr. Peter J. Kincaid, a colleague from the Faculty, for his valuable suggestions.

NOTES

³²Cardozo, B. N. "The Nature of Judicial Process" (New Haven: Yale University Press, 1921), p. 112.

³³Harris' *Hints on Advocacy* (18th edition, edited by Geo. W. Keeton; London: Stevens & Sons Ltd., 1943), p. 310.

³⁴Sir Frederick Pollock, quoted by Roscoe Pound in "Mechanical Jurisprudence" (Columbia University Press; vol. viii—1908), p. 605.

³⁵Pound, R., *supra*.

³⁶*Supra*.

* Administration of justice as the end of law may be questionable, but for the purpose of our discussion it is assumed.

¹ Pound, R., *supra*.

² *Supra*.

³ Graham, B. "The Intelligent Investor" (New York: Harper and Brothers, 1954), p. 112.

⁴ Jackson, R. H., in *Morissette v. United States*, 342 U.S. 246, 276 (1952).

⁵ Pound, R., *supra*, p. 606.

⁶ *Supra*.

⁷ *Supra*.

⁸ *Supra*, p. 607.

⁹ Holmes, O. W. "Certainty of Criminal Justice" in *Justice Oliver Wendell Holmes*, edited by Shriver, H. C. (New York: Central Book Company, 1936) Part I, Early Book Notices, p. 111; see also Cohen, M. R., "The Place of Logic in Law" (Harvard Law Review, Cambridge, Mass.: The Harvard Law Review Association, 1916; vol. XXIX, 1915-1916).

¹⁰ Frank, J. "Mr. Justice Holmes and non-Euclidean Legal Thinking", *The Cornell Law Quarterly*, Ithaca, N.Y., 1932; vol. XVIII (1931-32), pp. 568-603.

¹¹ *Supra*, pp. 571-572.

¹² *Supra*, p. 593.

¹³ Holmes, O. W. in *Lochner v. New York*, 198 U.S. 45, 76 (1905).

¹⁴ *Supra*.

¹⁵ Holmes, O. W. in *New York Trust Co. v. Eisner*, 256 U.S. 345, 349 (1921).

¹⁶ Holmes, O. W., "The Path of the Law", *Collected Legal Papers* (New York: Harcourt, Brace and Company, 1920), pp. 181, 182.

¹⁷ *Supra*.

¹⁸ Dewey, J., "Logical Method and Law", *The Cornell Law Quarterly*, Ithaca, N.Y., 1925, vol. X (1924-25), p. 21.

¹⁹ Quoting again Holmes: "The actual life of the law has not been logic: it has been experience. The felt necessities of the times, the prevalent moral and political theories, intuitions of public policy, avowed or unconscious, even the prejudices which judges share with their fellow men, have had a good deal more than the syllogism in determining the rules by which men should be governed." Holmes, O. W., "The Common Law" after Dewey, J., *supra*.

²⁰ Dewey, J., *supra*.

²¹ *Supra*, p. 22.

²² Holmes, O. W., "Collected Legal Papers", after Dewey, J., *supra*, p. 20.

²³ Cohen, M. R., *supra*, p. 630.

²⁴ *Supra*.

²⁵ *Supra*.

²⁶ *Supra*.

²⁷ Von Ihering "Im Juristischem Begriffshimmel" in "Schertz und Ernst in der Jurisprudenz" (11th ed. 1912), p. 245, as described in P. F. Cohen, "Transcendental Nonsense and the Functional Approach", *Columbia Law Review*, New York, 1935, vol. XXXV (1935), p. 809.

²⁸ Cohen, F. S., *supra*.

²⁹ *Supra*.

³⁰ Vinson, F. M. in *Dennis v. United States*, 341 U.S. 484, 508 (1951).

³¹ See Cohen, F. S., "Field Theory and Judicial Logic", *The Yale Law Journal* (New Haven, The Yale Law Journal Company Inc., 1950), vol. 59 (1949-50), pp. 238-272.

³² *Supra*, p. 271.

³³ *Supra*.

³⁴ Holmes, O. W., "The Common Law" (Boston: Little, Brown and Company, 1881), p. 310.

³⁵ Cohen, F. S., *supra*, p. 272.

³⁶ *Supra*.

³⁷ Cohen, M. R., *supra*, p. 638.

³⁸ Dewey, J., *supra*, p. 17.

INTELLECTUAL RESPONSIBILITY AND ARBITRARY DIVISIONS IN THE SOCIAL SCIENCES

A. M. HEALY*

DISSATISFACTION with the nature and teaching of the social sciences has been almost universal, ever since they gained recognition as "proper" disciplines worthy of university study. For example, the pioneer American sociologist William Graham Sumner complained in 1879 that "the social sciences are, as yet, the stronghold of many pernicious dogmatisms".¹ Ninety years later the young sociologist John F. Szwed, editing a volume on America's racial problems, indicted the social sciences as "often disappointing".² (To cap this, one of Britain's most eminent sociologists, writing to me in 1973, branded his confrères "an unadventurous lot".)

This kind of dissatisfaction, of course, can indicate either vitality or malaise. I incline to the latter interpretation. My fear is that quality (in terms of continuously appraising and improving the basic approach) is being sacrificed to stereotyped quantity. Perhaps the greatest problem today derives from the fact that compartmentalisation (both regional and thematic) is galloping ahead, while the fundamental need for broad comparative perspective has been left behind and is increasingly derided by limited "specialists".

Western scholars have given up too easily the Renaissance ideal of encyclopaedic man, at least in relation to significant culture/idea systems. Our ready access to masses of detailed data, together with the traditional divisions among university "subjects", have accentuated a trend towards the exclusive study of narrow specifics. (This is particularly ominous when it is tied in with Western cultural arrogance: though ironically we may yet be brought back to sanity by Asian and African scholars who, being caught in complex cross-cultural situations, find our divisions obstructive.)³ To the social scientist, as to the true student of the humanities, the world as a whole, in its total time-scale, should be his sphere of reference; but the majority now—whether through inertia or despair or personal ambition—seem to be rejecting this ideal, and content themselves with working within a framework dictated essentially by the cultural premises of their native environment.

On this basis, however, the social sciences cannot properly function or progress, still less contribute to human betterment.

* Senior Lecturer in History, Wollongong University College.